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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/637,208	08/08/2003	Ben Banney	MAX-0010	4077

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PHILADELPHIA, PA 19103

EXAMINER

DOERRLER, WILLIAM CHARLES

ART UNIT	PAPER NUMBER
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3744

DATE MAILED: 05/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/637,208

Applicant(s)

BANNEY ET AL.

Examiner

William C Doerrler

Art Unit

3744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☒ Certified copies of the priority documents have been received in Application No. 09/857,668.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date: _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date: _____  | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2 and 19 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Wright et al.

Wright et al disclose a heat exchanger for passing a liquid in thermal contact with a thermoelectric device having 16 fins/inch (column 3 line 43) with the fins having a thickness of .008 inch (column 3 line 38). These numbers convert to a thickness of .2 mm and 630 fins/meter. Since there will be 16 fins/inch and the fins are .008inch thick, there will be .128 inch of fin per inch. Dividing the remaining .872 " by 16 leaves each passage with a width of .055", or 1.4mm. Plugging 1.4 as W into the equation of claim 1 yields a minimum N of 426. Thus Wright et al's 630 fins/meter meets the limitation of 426 fins/meter derived from the equation of claim 1.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-22 are rejected under 35 U.S.C. 103(a) as being obvious over the article by Jiang et al in view of Wright et al.

Jiang et al on page 1044 describe a heat exchanger having channels .2mm wide with walls .2mm thick. Using .2 as W, the equation of claim 1 gives a minimum number of channels/meter as 49.8. If one channel and one wall are combined for .4mm, there will be 2500 channels in a meter of the described heat exchanger. Thus the equation of claim 1 is met. Using .2 as W in the thickness equation of claim 4, gives a minimum thickness of .108 mm. Thus the thickness disclosed (.2mm) meets the minimum claimed in claim 4. The height of the channel is given as .6mm, well below the claimed limit of 10mm. Jiang et al do not specifically mention the heat exchanger being used to cool a thermoelectric device. Wright et al show microchannel heat exchangers to be applicable to the heat transfer of thermoelectric elements. It would have been obvious to one of ordinary skill in the art at the time of applicants' invention from the teaching of Wright et al to apply the heat exchanger of Jiang et al to a thermoelectric device to

ensure efficient heat transfer. In regard to claims 3,6,9,12,15,18 and 20, the thermal conductivity of the walls given in page 1044 of Jiang et al (398.1) will, if multiplied the given distance and inverted give a thermal resistance of .06K/W, which satisfies the claimed limit. The determined minimum thickness and number of channels using the dimensions above also meet the claimed ranges of claims 10-18. Jiang et al is applicable since the subject matter claimed (the relationship between the channel width, the number of channels and the wall thickness) was not disclosed in the parent application.

### ***Response to Arguments***

Applicant's arguments filed 4-13-2005 have been fully considered but they are not persuasive. There is no claimed structure in claims 1 or 2 that is not shown by Wright et al. Applicants have states that the thermal resistance is different, but this limitation is found in claim 3, which was never rejected. The fact that the fin height limits of Wright et al are not specifically the same as applicants' range does not negative the fact that the fin height of the reference is clearly in applicants' range (anticipating applicants' claimed range). Laminar flow is also not claimed in any of the claims anticipated by Wright et al.

In regard to Jiang et al, applicants' parent application do not disclose the numerical correlation of the number of fins, channel width or wall thickness which are currently being relied upon for patentability. The Jiang et al reference will not be applied if applicant supplies the portion of the earlier application which states this relation as currently claimed. The fact that applicants' earlier application is a plate/fin heat


exchanger does not mean that no plate/fin heat exchangers of subsequent date may be applied. Applicants' current claims all rely on either the numerical correlation of the parameters listed above or a table which lists possibilities for these parameters which equate to the claimed equations. The earlier patents do not state this correlation, so subsequent references (prior to the current filing date) may be used. In the opinion of the examiner, any heat exchanger can be used to transfer heat from any source for a given temperature range. Nonetheless, in the interest of compact prosecution, Wright et al is now relied upon to show plate fin heat exchangers for thermoelectric to be old in the art. Combined with the dimensional limitations of Jiang et al, Wright et al provide a heat exchanger for thermoelectrics with flat plates separated by a distance as prescribed by applicants' claims by walls with a thickness also prescribed by applicants' claims. Thus, one of ordinary skill in the art at the time of applicants' invention was provided with all the claimed limitations as well as a commonality (microchannel heat exchangers) to provide a nexus to combine the references. The fact that Jiang et al state a thermal conduction for the heat exchanger instead of thermal resistance is immaterial. The statement that the reference does not contain a teaching for converting between the two is analogous to stating that a reference that gives a temperature in Celsius without stating that the temperature can be converted to Fahrenheit can not be used to teach a Fahrenheit limitation. One of ordinary skill in the art would recognize the inverse relationship between conductivity and resistance.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C Doerrler whose telephone number is (571) 272-4807. The examiner can normally be reached on Monday-Friday 6:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on (571) 272-4834. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
William C Doerrler  
Primary Examiner  
Art Unit 3744

WCD